



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

SHEET 1 OF 5
(REV. 7-80)

RECEIVED

AUG 06 2003

CH CENTER 1600/2900

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

U.S. PATENT DOCUMENTS

<u>*EXAMINER</u> <u>INITIALS</u>	<u>DOCUMENT</u> <u>NUMBER</u>	<u>DATE</u>	<u>NAME</u>	<u>CLASS</u>	<u>SUBCLASS</u>	<u>FILING DATE</u>
-------------------------------------	----------------------------------	-------------	-------------	--------------	-----------------	--------------------

FOREIGN PATENT DOCUMENTS

<u>*EXAMINER</u> <u>INITIALS</u>	<u>DOCUMENT</u> <u>NUMBER</u>	<u>DATE</u>	<u>COUNTRY</u>	<u>CLASS</u>	<u>SUBCLASS</u>	<u>TRANSLATION</u> <u>YES</u> <u>NO</u>
-------------------------------------	----------------------------------	-------------	----------------	--------------	-----------------	--

OTHER REFERENCES**(INCLUDING AUTHOR, TITLE DATE, PERTINENT PAGES, ETC.)**

*EXAMINER
INITIALS

1. Adam, H.K., et al., J. Chromatogr., "Estimation of ICI 35,868 (Diprivan[®]) in blood by high-performance liquid chromatography, following coupling with Gibbs' reagent," 1981;223:232-237
2. Amann, E., et. al., Gene, "Tightly regulated *tac* promoter vectors useful for the expression of unfused and fused proteins in *Escherichia coli*," 1988;69:301-315
3. Baggi, T.R., et al., J. Assoc. of Anal. Chem., "Spectrophotometric Determination of Piperazine in Pharmaceutical Preparations," 1974; 57(5):1144-1146
4. Baggi, T.R., et al., Forensic Sci., "Visualisation of opium alkaloids on TLC plates by Gibbs reagent spray," 1976;8:265-267
5. Beil, S., et. al., J. Bac., "Identification of chlorobenzene dioxygenase sequence elements involved in dechlorination of 1,2,4,5-tetrachlorobenzene," 1998;180(21):5520-5528



FORM PTO-1449

DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

SHEET 2 OF 3
(REV. 7-80)

RECEIVED

AUG 06 2003

TECH CENTER 1600/290

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

6. Belal, F., Analyst, "Use of 2,6-dichloroquinone chlorimide for the spectrophotometric determination of halogenated derivatives of 8-hydroxyquinoline," 1984;109:615-618
7. Boyd, D.R., et. al., J. Chem. Soc., Chem. Commun., "Enzymatic and chemical syntheses of *cis*-dihydrodiol derivatives of monocyclic arenes," 1991;22:1630-1632
8. Boyd, D.R., et. al., J. Chem. Soc., Perkin Trans., "Enzymatic and chemoenzymatic synthesis and stereochemical assignment of *cis*-dihydrodiol derivatives of monosubstituted benzenes," 1998;1:1935-1943
9. Boyd, J.A. and Eling T.E., J. Biol. Chem., "Evidence of one-electron mechanism of 2-aminofluorene oxidation by prostaglandin H synthase and horseradish peroxidase," 1984;259(22):13885-13896
10. Brühlmann, F. and Chen, W., Biotech. Bioeng., "Tuning biphenyl dioxygenase for extended substrate specificity," 1999;63(5):544-551
11. Buckland, B.C., et. al., Metabolic Engineering, "Microbial conversion of indene to indandiol: a key intermediate in the synthesis of CRIXIVAN," 1999;1:63-74
12. Butler C.S. and Mason, J.R., Adv. Micr. Phys., "Structure-function analysis of the bacterial aromatic ring-hydroxylating dioxygenases," 1997;38:47-84
13. Coop A., et al., Tetrahedron, "Methylation of the enolates of thevinone and some analogues," 1995;51(35):9681-9698
14. Dacre, J.C., Anal. Chem., "Nonspecificity of the Gibbs reaction," 1971;43(4):589-591



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

SHEET 3 OF 9
(REV. 7-80)**LIST OF REFERENCES CITED BY APPLICANT**

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

15. Ensley, B.D., *Chimia*, "Biosynthesis of the textile dye indigo by a recombinant bacterium," 1994;48(11):491-492
16. Flavin, M.T., et al., *J. Med. Chem.*, "Synthesis, chromatographic resolution, and anti-human immunodeficiency virus activity of (\pm)-calanolide A and its enantiomers," 1996;39:1303-1313
17. Frost, J.W. and Lievens, J., *New J. Chem.*, "Prospects for biocatalytic synthesis of aromatics in the 21st century," 1994;18:341-348
18. Gibbs, H.D., *J. Biol. Chem.*, "Phenyl Tests," 1927;72:649-664
19. Gibson, D.T., et al., *Biochemistry*, "Formation of (\pm)-*cis*-2,3-dihydroxy-1-methylcyclohexa-4,6-diene from toluene by *pseudomonas putida*," 1970;9:1626-1630
20. Gibson, D.T., and Parales, R.E., *Curr Opin Biotechnol.*, "Aromatic hydrocarbon dioxygenases in environmental biotechnology," 2000, June;11:236-243
21. Gilbert, S.C., et al., *Microbiology*, "Isolation of a unique benzothiophene-desulphurizing bacterium, *Gordona* sp. Strain 213E (NCIMB 40816), and characterization of the desulphurization pathway," 1998;144:2545-2553
22. Hallit, Z. and Damas, D., *Microsc. Acta*, "A new histochemical method for demonstration of sulfhydryl groups," 1981;84(1):1-7
23. Harfoush, A.A., *Z. phys. Chemie, Leipzig*, "Medium effect on the reaction between gibb's reagent and thiosulphate," 1986;267:682-688



AUG 06 2003

TECH CENTER 1600/2900

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

24. Harrop, A.J., et al., *Enz. Micr. Tech.*, "Production of naphthalene-*cis*-glycol by *pseudomonas putida* in the presence of organic solvents," 1992;14(9):725-730

25. Hudlicky, T., et. al., *J. Am. Chem. Soc.*, "Toluene dioxygenase-mediated *cis*-dihydroxylation of aromatics in enantioselective synthesis. Asymmetric total syntheses of pancratistatin and 7-deoxypancratistatin, promising antitumor agents," 1996;118:10752-10765

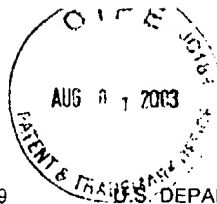
26. Hudlicky, T., et. al., *Chem. Commun.*, "Current status and future perspectives of cyclohexadiene-*cis*-diols in organic synthesis: versatile intermediates in the concise design of natural products," 1996;17:1993-2000

27. Jenkins, R.O., et. al., *Biotech. Bioeng.*, "Production of toluene *cis*-glycol by *pseudomonas putida* in glucose fed-batch culture," 1987;29(7):873-883

28. Johnston, J.B., et al., *Enzyme Microb. Technol.*, "Production of substituted catechols from substituted benzenes by a *pseudomonas* sp.," 1987;9:706-708

29. Josephy, P.D., *Anal. Chem.*, "Reaction of gibbs reagent with para-substituted phenols," 1984;56:813-814

30. Josephy, P.D. and Lenkinski, R.E., *J. Chromatogr.*, "Reaction of gibbs reagent (2,6-dichlorobenzoquinone 4-chloroimine) with the antioxidant BHA (3-*tert*.-butyl 4-hydroxyanisole): isolation and identification of the major product," 1984;294:375-379



AUG 06 2003

TECH CENTER 1600/2900

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

- 8 31. Kayser, K.J., et al., J. Gen. Microbiol., "Utilization of organosulphur compounds by axenic and mixed cultures of *Rhodococcus rhodochrous* IGTS8," 1993;139:3123-3129
- 8 32. Kobylanskii, A.G., et al., Vopr. Med. Khim., 1994;40:40-46 - *No translation*
- 8 33. Kumamaru, T., et al., Nat. Biotech., "Enhanced degradation of polychlorinated biphenyls by directed evolution of biphenyl dioxygenase," 1998;16:663-666
- 8 34. Lange C.C., and Wackett, L.P., J. Bac., "Oxidation of aliphatic olefins by toluene dioxygenase: enzyme rates and product identification," 1997;179(12):3858-3865
- 8 35. Lehning, et al., App. Env. Micro., "Metabolism of chlorotoluenes by *Burkholderia* sp. Strain PS12 and toluene dioxygenase of *Pseudomonas putida* F1: evidence for monooxygenation of toluene and chlorobenzene dioxygenases," 1997;63(5):1974-1979
- 8 36. Mason, J.R. and Cammack, R., Annu. Rev. Microbiol., "The electron-transport proteins of hydroxylating bacterial dioxygenases," 1992;46:277-305
- 8 37. McAllister, R.A., J. Pharm., Lond., "A colorimetric method for the determination of 1-methyl-2-mercaptoimidazole," 1951;3(8):506-510
- 8 38. Miller, P. and Oberholzer V., Clin. Chem., "Dichlorobenzoquinone chloroimine colorimetry of uric acid in urine," 1990;36(4):668-669
- 8 39. Miyazaki, K., et al., J. Mol. Biol., "Directed evolution study of temperature adaptation in a psychrophilic enzyme," 2000, April;297:1015-1026



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

SHEET 6 OF 9
(REV. 7-80)

RECEIVED

AUG 06 2003

TECH CENTER 1600/2900

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

40. Mondello, F., et. al., Appl. Env. Microbiol., "Identification and modification of biphenyl dioxygenase sequences that determine the specificity of polychlorinated biphenyl degradation," 1997;63(8):3096-3103

41. Mondello, F.J., J. Bac. 1989;171(3):1725-1732

42. Moore, J.C. and Arnold, F.H., Nat. Biotech., "Directed evolution of a *para*-nitrobenzyl esterase for aqueous-organic solvents," 1996;14:458-467

43. Orlewski, P. and Leszek, T., Med. Pr., "Przydatnosc Zmodyfikowanej Metody Skriningowej Wykrywania Fenolu W Slinie Do Oceny Ekspozycji Przemyslowej Na Ten Zwiazek," 1982;33(4):215-221

44. Pallagi, I., et al., J. Org. Chem., "Mechanism of the gibbs reaction. 3.¹ Indophenol formation via radical eletrophilic aromatic substitution ($S_{\text{RE}}\text{Ar}$) on phenols," 1994;59:6543-6557

45. Pallagi, I., et al., J. Org. Chem., "Mechanism of the Gibbs Reaction. Part 4.¹ Indophenol formation via *N*-chlorobenzoquinone imine radical anions. The Aza- $S_{\text{RN}}2$ 1,4-benzoquinones and cyanide ion," 1999;64:6530-6540

46. Panadero, S., et al., Intern. J. Anal. Chem., "Kinetic determination of dicoumarol on grain by using stopped-flow mixing methodology," 1993;50:45-51

47. Quintana, M. G., et. al., Biotechnol. Tech., "Colorimetric method for a rapid detection of oxygenated aromatic biotransformation products," 1997;11(8):585-587



RECEIVED

AUG 06 2003

TECH CENTER 1600/23

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

48. Reider, P.J., Chimia, "Advances in AIDS chemotherapy: The Asymmetric Synthesis of CRIXIVAN[®]," 1997;51:306-308

49. Resnick, S.M., et al., Appl. Env. Micro., "Oxidation of 6,7-dihydro-5H-benzocycloheptene by bacterial strains expressing naphthalene dioxygenase, biphenyl dioxygenase, and toluene dioxygenase yields homochiral monol or *cis*-diol enantiomers as major products," 1996;62(4):1364-1368

50. Resnick, S.M., et al., Appl. Env. Micro., "Regio- and stereospecific oxidation of 9,10-dihydroanthracene and 9,10-dihydrophenanthrene by naphthalene dioxygenase: structure and absolute stereochemistry of metabolites," 1996;62(9):3355-3359

51. Resnick, S.M., et al., J. of Ind. Microbiol., "Diverse reactions catalyzed by naphthalene dioxygenase from *Pseudomonas* sp strain NCIB 9816," 1996;17:438-457

52. Robertson, J.B., et al., Appl. Env. Micro., "Oxidation of nitrotoluenes by toluene dioxygenase: evidence for a monooxygenase reaction," 1992;58(8):2643-2648

53. Searle, C.E., J. Appl. Chem., "Colour reactions of 2:6-dichloroquinone chloroimide with derivatives of glyoxaline-2-thiol," 1955;5:313-316

54. Sheldrake, G.N., 1992. Chapter 6: "Biologically Derived Arene *cis*-Dihydrodiols as Synthetic Building Blocks," In: Chirality in Industry. Collins, Sheldrake, and Crosby (Eds.), pp. 127-166. John Wiley & Sons Ltd., New York

55. Singh, J., et al., FEBS Lett., "A method for α -L-iduronidase assay," 1974;45(1):248-251



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

SHEET 8 OF 10 RECEIVED
(REV. 7-80)

AUG 06 2003

TECH CENTER 1600/2900

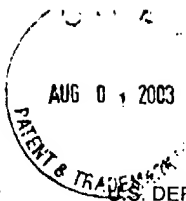
LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

*EXAMINER
INITIALS

- § 56. Spain, J.C., et al., Appl. Env. Micro., "Monohydroxylation of phenol and 2,5-dichlorophenol by toluene doxoygenase in *Pseudomonas putida* F1," 1989;55(10):2648-2652
- § 57. Suzuki, Y. and Uchida, K., Biochim. Biophys. Acta, "Formation of β -galactosyl compounds of pyridoxine in growing culture of *Sporobolomyces singularis*," 1992;1116:67-71
- § 58. Tadera, K., et al., J. Nutr. Sci. Vitaminol., "Isolation and structural elucidation of three new pyridoxine-glycosides in rice bran," 1988;34:167-177
- § 59. Uemura, T., et al., J. Neurochem., "Isolation, structure, and properties of the β -carboline formed from 5-hydroxytryptamine by the superoxide anion-generating system," 1988;51(3):710-717
- § 60. Velösy, G.A., J. Clin. Chem. Clin. Biochem., "Eine neue Method zur kontinuierlichen Bestimmung der katalytischen Aktivität der Pankreas-Carboxyl-Esterase¹)" 1985;23:887-889 *no translation*
- § 61. Vinson, J.A., et al., J. Chromatogr., "Sensitive thin-layer chromatographic method for urine screening of barbiturates," 1977;140:71-76 *General finding, 6/10/03*
- § 62. Wackett, L.P., Environ. Health Perspect., "Recruitment of Co-metabolic Enzymes for Environmental Detoxification of Organohalides," 1995;103(5):45-48
- § 63. Wahbi, L.P., et. al., Enzyme and Microbial Technology, "Construction and use of recombinant *Escherichia coli* strains for the synthesis of toluene *cis*-glycol," 1996;19:297-306
- § 64. Wendeborn, S., et al., Synlett., "Polymer Bound 3,5-Cyclohexadiene-1,2-diols as Core Structures for the Development of Small Molecule Libraries," 1998;8:865-868

RECEIVED
SHEET 9 OF 9
(REV. 7-80) AUG 06 2003

TECH CENTER 1600/2900

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 4058/1H222US1 SERIAL NO: 09/828,599
APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
CONFIRMATION NO: 5688

***EXAMINER
INITIALS**

- § 65. Wilkinson, D., et al., J. Ind. Micr., "Choice of microbial host for the naphthalene dioxygenase bioconversion," 1996;16:274-279
- § 66. Williams, M.G., et al., App. Microbiol. Biotech., "The application of toluene dioxygenase in the synthesis of acetylene-terminated resins," 1990;34:316-321
- § 67. Wojtaszek P. and Peretiatkiewicz, M., Acta Biochim. Pol., "A simple method for visualization of phenolics exudation by roots of intact lupin plants; the effect of nitrate and pH," 1992;39(4):307-316
- § 68. Zhao, H., et al., 1999, "Methods for optimizing industrial enzymes by directed evolution. In: Manual of Industrial Microbiology and Biotechnology," 2nd Ed. (Demain, A.L., & Davies J.E., Eds), 597-604 ASM press, Washington, D.C.
- § 69. Zylstra, G.J. and Gibson, D.T., J. of Bio. Chem., "Toluene degradation by *Pseudomonas putida* F1," 1989;264(25):14940-14946

EXAMINER:

DATE CONSIDERED:

12/22/03

***EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

RECEIVED

OCT 01 2001

TECH CENTER 1600/2900



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE PATENT & TRADEMARK OFFICE

SHEET 1 OF
(REV. 7-80)

LIST OF REFERENCES CITED BY APPLICANT

(Use Several Sheets if Necessary)

DOCKET NO.: 9373/1H222US1 SERIAL NO: 09/828,599
 APPLICANT: Frances H. ARNOLD, et al. FILING DATE: April 5, 2001
 CONFIRMATION NO:

U.S. PATENT DOCUMENTS

*EXAMINER INITIALS	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	1. 5,334,773	08/02/94	Grund			
	2. 5,284,759	02/08/94	Mader et al.			

FOREIGN PATENT DOCUMENTS

*EXAMINER INITIALS	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO

OTHER REFERENCES

(INCLUDING AUTHOR, TITLE DATE, PERTINENT PAGES, ETC.)

*EXAMINER
INITIALS

EXAMINER:

DATE CONSIDERED: 12/22/03

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.